

A long-duration M5/3n solar flare on 22/1308 UTC from Region 1745 (N13, L=333, class/area=Cao/150 on 20 May) brought solar activity to high levels and set the stage for space weather for the remainder of the week. The flare produced a solar energetic proton event which lasted for almost three days. The flare was also associated with an asymmetric halo coronal mass ejection (CME). The CME was first seen in the LASCO C2 coronagraph imagery at 22/1325 UTC and later in the C3 imagery at 22/1330 UTC. The event was also visible in STEREO COR2 imagery at 22/1334 UTC. Imagery analysis suggested the CME was moving at 1488 km/s. The CME produced Type II (22/1259 UTC 1962 km/s) and Type IV (22/1303 UTC) radio emissions, and a 370 sfu Tenflare was also observed with the event at 22/1313 UTC. Region 1745 crossed the west limb on 23 May. The only other M-flare to occur during the week was an M1 flare from the limb observed at 20/0525 UTC beyond the northeast limb, possibly old Region 1731 (N09, L=188). A Type II emission was observed at 20/1141 UTC but not attributed to any particular region. The largest region on the disk for the majority of the week was Region 1756 (S20, L=214, class/area=Ehi/290 on 25 May), which appeared on 21 May and by 22 May had developed beta-gamma magnetic characteristics. It was responsible for 12 C-class flares and 28 optical flares during the week, followed by Region 1750 (N11, L=201, class/area=Dhi/290 on 23 May) which produced five C-class events and 10 optical flares respectively.

Proton flux at geosynchronous orbit reached alert thresholds this week. A 10 MeV greater than 10 pfu event began at 22/1420 UTC. The 100 MeV flux passed the 1 pfu threshold 35 minutes later, reached a maximum of 3.5 pfu at 22/1830 UTC and was over by 23/0745 UTC. The 10 MeV flux continued to rise until 23/0650 UTC when it reached a peak flux of 1660 pfu, and ended at 25/0845 UTC when it fell below 10 pfu.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 24-26 May. The peak flux recorded during the week was 11,900 pfu on 26/2205 UTC. It is important to note that the GOES-13 experienced an anomaly which rendered the Space Environment Monitor (SEM) instrumentation inoperable beginning 22/1006 UTC. Consequently, all particle measurements were obtained from GOES-15, the secondary platform.

The geomagnetic field ranged from quiet to minor storm levels during the week in response to two CMEs and a coronal hole high speed stream. The week began with a weak CME that arrived at Earth at 19/2306 UTC. Although the total field reached 15 nT, the Bz component of the magnetic field remained positive throughout most of the event. Consequently only unsettled conditions were observed on the 20th and quiet returned on the 21st. A solar sector boundary change early on 22 May resulted in an active first period. The remainder of the day was characterized by quiet to unsettled conditions which persisted through most of 24 May. Late on 24 May, the CME from 22 May arrived. The interplanetary shock passed the ACE spacecraft at approximately 24/1736 UTC and an 18 nT sudden impulse was subsequently observed on the Boulder magnetometer at 24/1812 UTC. Active geomagnetic conditions were observed one minute later, and minor storm conditions followed at 24/1853 UTC. Active to minor storm conditions were observed for the remainder of 24th through the 25th. Between 25/1900-2100



UTC, solar wind speed at the ACE spacecraft increased from around 600 km/s to 842 km/s before settling near 700 km/s. The increase in wind speed was accompanied by a brief elevation in density and rising temperature suggesting the arrival of a coronal hole high speed stream. The combined effects of the CME and coronal hole contributed to minor storm conditions which persisted through the end of the day. The first three synoptic periods of 26 May were characterized by active geomagnetic conditions while the remainder of the day was quiet to unsettled.

Space Weather Outlook

27 May - 22 June 2013

Solar activity is expected to be low with a chance for moderate activity through the forecast period, with high levels of activity possible from 07 June through 22 June with the return of Old Region 1748.

No proton events are expected at geosynchronous orbit, although there is a chance from 05 June through 20 June with the return of Old Region 1745.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels through 31 May. High levels are expected to return from 5-7 June and 20-22 June in response to recurrent coronal hole high speed streams.

In the absence of any Earth-directed coronal mass ejections, geomagnetic field activity is expected to be quiet to unsettled with active periods possible on 01 June and 21 June associated with recurrent coronal hole high speed streams.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
20 May	132	113	590	B7.0	7	1	0	21	1	0	0	0
21 May	125	119	670	B5.5	6	0	0	11	1	0	0	0
22 May	133	107	780	C1.0	4	1	0	15	0	0	1	0
23 May	135	117	710	B6.5	6	0	0	10	2	0	0	0
24 May	127	99	570	B4.5	3	0	0	12	0	0	0	0
25 May	121	107	680	B3.9	4	0	0	2	0	0	0	0
26 May	120	92	550	B3.8	2	0	0	6	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day -sr)			Electron Fluence (electrons/cm ² -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
20 May	7.0e+06	2.0e+05	2.5e+03		2.2e+06	
21 May	3.3e+06	5.9e+04	2.1e+03		2.9e+06	
22 May	1.9e+07	8.3e+06	9.4e+04		1.6e+07	
23 May	2.3e+08	6.9e+07	7.0e+04		2.0e+08	
24 May	9.8e+07	5.2e+06	1.0e+04		5.9e+07	
25 May	2.8e+07	5.9e+05	3.3e+03		2.3e+07	
26 May	2.9e+06	3.6e+04	2.1e+03		3.0e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
20 May	6	2-1-0-1-3-2-2-2	6	2-2-0-2-2-2-2-1	7	3-2-1-1-2-2-2-2
21 May	8	2-2-2-2-3-1-2-2	7	2-1-4-1-1-0-1-2	7	2-2-2-1-1-1-2-2
22 May	10	3-2-2-2-3-2-3-2	15	3-2-2-4-4-4-2-1	12	4-2-2-2-3-3-2-3
23 May	8	1-3-1-2-3-2-2-2	10	1-3-2-4-3-1-2-1	7	2-3-1-2-2-2-2-2
24 May	17	2-3-2-2-3-2-5-4	25	2-3-4-4-6-3-3-3	20	2-3-3-2-3-2-5-4
25 May	25	4-5-4-3-3-4-3-4	55	4-5-5-5-6-6-6-4	32	4-5-3-4-4-5-4-5
26 May	19	4-4-4-2-3-3-3-3	24	3-4-6-4-3-3-2-2	18	4-4-4-2-2-3-3-3



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
20 May 1155	CANCELLATION: Geomagnetic Storm Category G2 predicted	
20 May 1216	ALERT: Type II Radio Emission	20/1141
22 May 0037	WARNING: Geomagnetic K = 4	22/0036 - 0700
22 May 0250	ALERT: Geomagnetic K = 4	22/0250
22 May 1325	ALERT: X-ray Flux exceeded M5	22/1323
22 May 1344	ALERT: Type II Radio Emission	22/1259
22 May 1349	SUMMARY: 10cm Radio Burst	22/1309 - 1337
22 May 1352	WARNING: Proton 10MeV Integral Flux > 10pfu	22/1355 - 23/1200
22 May 1404	WARNING: Proton 100MeV Integral Flux > 1pfu	22/1405 - 23/0600
22 May 1428	ALERT: Proton Event 10MeV Integral Flux >= 10pfu	22/1420
22 May 1443	SUMMARY: X-ray Event exceeded M5	22/1230 - 1426
22 May 1503	ALERT: Proton Event 100MeV Integral Flux > 1pfu	22/1455
22 May 1521	ALERT: Proton Event 10MeV Integral Flux >= 100pfu	22/1520
22 May 1530	ALERT: Type IV Radio Emission	22/1303
23 May 0258	ALERT: Electron 2MeV Integral Flux >= 1000pfu	23/0240
23 May 0348	ALERT: Proton Event 10MeV Integral Flux >= 1000pfu	23/0330
23 May 0509	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	23/0240
23 May 0543	EXTENDED WARNING: Proton 100MeV Integral Flux > 1pfu	22/1405 - 23/1400
23 May 0543	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	22/1355 - 23/1900
23 May 1333	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	22/1455 - 23/0745
23 May 1536	CANCELLATION: Electron 2MeV Integral Flux >= 1000pfu	
23 May 1811	SUMMARY: Proton Event 10MeV Integral Flux >= 1000pfu	23/0330 - 1040
23 May 1824	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	22/1355 - 24/0700
23 May 1952	WATCH: Geomagnetic Storm Category G1 predicted	



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
24 May 0630	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	22/1355 - 25/0100
24 May 0958	SUMMARY: Proton Event 10MeV Integral Flux >= 100pfu	22/1730 - 24/0435
24 May 1612	ALERT: Electron 2MeV Integral Flux >= 1000pfu	24/1555
24 May 1747	WARNING: Geomagnetic Sudden Impulse expected	24/1750 - 1850
24 May 1749	WARNING: Geomagnetic K = 4	24/1750 - 25/0200
24 May 1815	WARNING: Geomagnetic K = 5	24/1814 - 2200
24 May 1816	ALERT: Geomagnetic K = 4	24/1813
24 May 1820	SUMMARY: Geomagnetic Sudden Impulse	24/1812
24 May 1853	ALERT: Geomagnetic K = 5	24/1853
24 May 2352	WARNING: Geomagnetic K = 5	24/2350 - 25/0400
24 May 2352	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 25/0700
25 May 0055	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	22/1355 - 25/0700
25 May 0356	EXTENDED WARNING: Geomagnetic K = 5	24/2350 - 25/0700
25 May 0356	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 25/1100
25 May 0435	ALERT: Geomagnetic K = 5	25/0434
25 May 0658	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 25/1900
25 May 0658	EXTENDED WARNING: Geomagnetic K = 5	24/2350 - 25/1300
25 May 1439	SUMMARY: Proton Event 10MeV Integral Flux >= 10pfu	22/1420 - 25/0845
25 May 1712	WARNING: Geomagnetic K = 5	25/1712 - 2300
25 May 1715	ALERT: Geomagnetic K = 5	25/1715
25 May 1836	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 26/0200
25 May 1900	WATCH: Geomagnetic Storm Category G1 predicted	
25 May 2113	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	24/1555
25 May 2216	EXTENDED WARNING: Geomagnetic K = 5	25/1712 - 26/0700
25 May 2216	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 26/1200
26 May 0652	EXTENDED WARNING: Geomagnetic K = 4	24/1750 - 26/1900

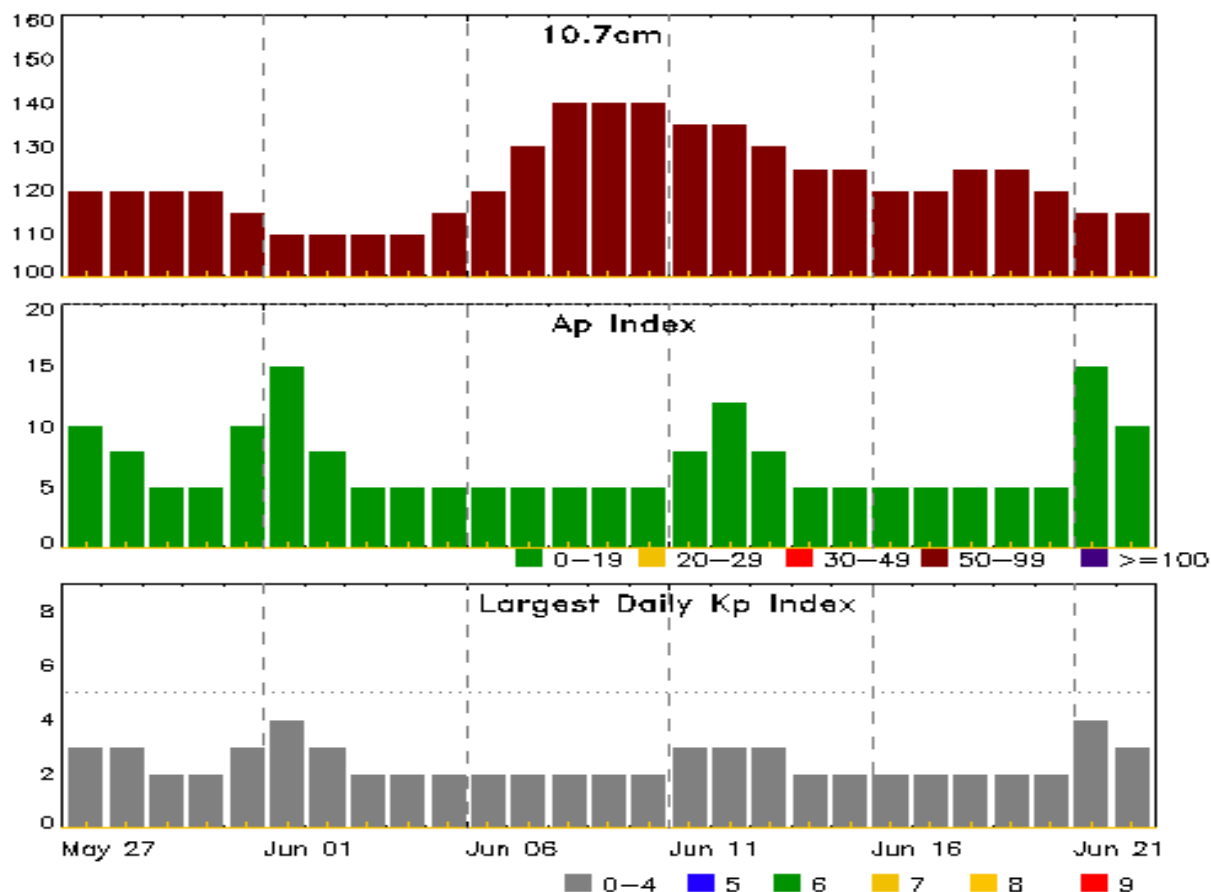


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
26 May 0652	EXTENDED WARNING: Geomagnetic K = 5	25/1712 - 26/1400
26 May 2236	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	24/1555



Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
27 May	120	10	3	10 Jun	140	5	2
28	120	8	3	11	135	8	3
29	120	5	2	12	135	12	3
30	120	5	2	13	130	8	3
31	115	10	3	14	125	5	2
01 Jun	110	15	4	15	125	5	2
02	110	8	3	16	120	5	2
03	110	5	2	17	120	5	2
04	110	5	2	18	125	5	2
05	115	5	2	19	125	5	2
06	120	5	2	20	120	5	2
07	130	5	2	21	115	15	4
08	140	5	2	22	115	10	3
09	140	5	2				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Half	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV
20 May	0516	0525	0603	M1.7	0.033			1755				
22 May	1308	1332	1408	M5.0	0.140	3N	N15W70	1745	140	370	2	1

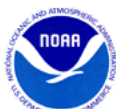
Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
20 May	0020	0048	0107		SF	N13E00	1748
20 May	0039	0046	0102		SF	S09W68	1750
20 May	0041	0047	0053	C4.0			1748
20 May	0506	U0506	A0508		SF	N12W04	1748
20 May	0516	0525	0603	M1.7			1755
20 May	0645	U0646	A0647		SF	N12W05	1748
20 May	0652	U0657	0658		SF	N12W05	1748
20 May	0733	0734	0737		SF	N12W05	1748
20 May	0734	0735	0737		SF	S12W73	1750
20 May	0735	0735	0737		SF	S27E64	1746
20 May	0808	0810	A0826		SF	N11W04	1748
20 May	0841	0845	0852		SF	N12W05	1748
20 May	0920	0927	0933		SF	N13W06	1748
20 May	0957	1003	1038		SF	N08W45	1745
20 May	1111	1116	1155		SF	N12W06	1748
20 May	1259	1305	1309		SF	S26W33	1751
20 May	1421	1428	1432	C2.7	SF	N14W09	1748
20 May	1448	1503	1524	C9.6	1B	N13W08	1748
20 May	1558	1606	1620		SF	N13W09	1748
20 May	1620	1626	1630	C6.0	SN	N13W09	1748
20 May	1914	1918	1929	C1.3	SF	N13W11	1748
20 May	2002	2010	2018	C1.6	SF	N05E66	1753
20 May	2146	2147	2150		SF	N13W12	1748
20 May	2227	2230	2233	C1.3	SF	N11W11	1748
21 May	0001	0010	0015	C1.5	SF	N10E84	1751
21 May	0027	0028	0029		SF	N11W12	1748
21 May	0041	0042	0044		SF	N11W13	1748
21 May	B0607	U0610	A0614		SF	N13W10	1748
21 May	0727	0748	0754	C1.1			1751



Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
21 May	1023	1040	1050	C1.2			1745
21 May	1037	1038	1039		SF	N10W55	1745
21 May	1040	1041	1043		SF	N12W54	1745
21 May	1124	1127	A1131		SF	N07E58	1753
21 May	1520	1525	1527	B8.9	SF	N14W27	1748
21 May	1732	1737	1740	C1.0			1755
21 May	1921	1924	1927		SF	S20E60	1756
21 May	1937	1942	1948		SF	S19E61	1756
21 May	2142	2142	2155		SF	S19E60	1756
21 May	2202	2209	2214	C1.5			
21 May	2232	2237	2243	C2.9	1F	S20E58	1756
22 May	0012	0024	0036	C1.1	SF	S20E56	1756
22 May	0050	0054	0057	C2.3	SF	S19E54	1756
22 May	0116	0118	0119		SF	N09E65	1755
22 May	0225	0256	0308	C1.9			1745
22 May	B0537	U0537	A0545		SF	S17E53	1756
22 May	0620	0649	0658		SF	S18E55	1756
22 May	0639	0642	0644		SF	N10W30	1748
22 May	0652	0652	0655		SF	N10W29	1748
22 May	B0837	U0840	A0857		SF	S17E50	1756
22 May	B0916	U0933	A0938		SF	N13W59	1745
22 May	B1235	1322	1555		3N	N15W70	1745
22 May	1253	1254	1302		SF	S20E54	1756
22 May	1308	1332	1408	M5.0			1745
22 May	1313	1318	1325		SF	S18W15	1747
22 May	1328	1345	1353		SF	S18W15	1747
22 May	1946	2009	2017	C2.4	SF	S20E48	1756
22 May	2241	2249	2315		SF	N10E57	1755
22 May	2328	2328	2348		SF	N10E57	1755
23 May	0649	0649	0651		SF	N11W43	1748
23 May	B0715	0734	0742		SF	S17E41	1756
23 May	0909	0914	0918	C1.4			1755
23 May	0944	0945	0947		SF	N13E51	1755
23 May	1158	1206	1220		SF	N12E50	1755
23 May	1226	1229	1231	C1.3	1F	N13E49	1755
23 May	1443	1450	1500	C3.9	SF	S20E37	1756
23 May	1525	1533	1549	C2.6	SF	S20E37	1756
23 May	1533	1540	1600		SF	N13W54	1748



Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
23 May	1639	1641	1654		SF	S20E37	1756
23 May	1658	1704	1719		SF	S19E36	1756
23 May	1820	1827	1839	C1.8	1F	S19E36	1756
23 May	1841	1847	1854	C3.4			1756
23 May	1952	1956	2033		SF	N05E14	
24 May	0119	0124	0132	C2.5			1757
24 May	0231	0232	0235		SF	N11W54	1748
24 May	0646	0647	0651		SF	S18E23	1756
24 May	0655	0658	0704		SF	S18E23	1756
24 May	0718	0718	0723		SF	N07W58	1748
24 May	B1005	U1006	A1015		SF	S17E26	1756
24 May	B1150	U1154	1201		SF	S17E25	1756
24 May	1326	1327	1332		SF	N11E36	1755
24 May	B1459	U1459	A1509		SF	S18E19	1756
24 May	1528	1529	1531		SF	N09E36	1755
24 May	B1545	U1549	A1554		SF	S18E19	1756
24 May	1631	1635	1641	C2.1	SN	S18E22	1756
24 May	2035	2039	2041	C1.0			1757
24 May	2054	2059	2102	B9.0	SF	N05E17	1753
24 May	2244	2248	2254	B9.8			1757
25 May	0129	0133	0137	C1.6			1756
25 May	0433	0440	0448	C1.1			1756
25 May	1039	1049	1059	C2.1			1755
25 May	1357	1358	1405		SF	N09E36	1755
25 May	1648	1652	1655	B6.2			1754
25 May	2015	2028	2044	C1.6	SF	N13E16	1755
26 May	0027	0034	0041	B7.7	SF	S20W03	1756
26 May	0150	0153	0155	B6.1			1756
26 May	0943	0957	1010	C3.8	SF	S17W11	1756
26 May	B1014	U1016	A1039		SF	S21W18	1754
26 May	1649	1653	1658		SF	N15W64	
26 May	1846	1851	1915		SF	S14W16	1756
26 May	2010	2019	2034		SF	S15W18	1756
26 May	2058	2147	2203	C1.7			1756



Region Summary

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

Region 1742

09 May	N30E49	17	50	7	Dai	12	B	1			2				
10 May	N30E36	17	100	7	Dao	6	B	1							
11 May	N30E22	18	50	9	Dao	4	B								
12 May	N30E10	17	50	9	Cao	5	B								
13 May	N30W06	19	30	1	Hrx	1	A								
14 May	N29W19	18	10		Hrx	1	A								
15 May	N28W31	18	plage												
16 May	N28W45	19	plage												
17 May	N28W59	20	plage												
18 May	N28W73	20	plage												
19 May	N28W86	20	plage												
								2	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 19

Region 1743

09 May	N24E55	11	30	5	Hrx	2	A								
10 May	N24E43	12	20	3	Cao	5	B								
11 May	N24E29	11	10	3	Bxo	4	B								
12 May	N24E15	12	110	5	Dao	10	B	2							
13 May	N22E01	12	120	7	Dao	6	B				1				
14 May	N22W12	12	70	9	Dao	7	B	1							
15 May	N21W28	14	90	9	Dao	5	B								
16 May	N22W40	13	80	10	Cso	6	B								
17 May	N22W53	14	30	10	Dao	2	B								
18 May	N20W69	16	10	1	Axx	2	A	1							
19 May	N20W82	16	plage												
								4	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 12



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
Region 1744															
09 May	N05E61	4	30	5	Dao	5	B	4			2				
10 May	N04E56	357	30	9	Dao	7	B	2			2				
11 May	N05E42	358	60	10	Dao	10	B	1			1				
12 May	N05E28	359	190	10	Dai	13	B	3							
13 May	N05E16	357	140	8	Dai	11	B								
14 May	N05W00	359	90	9	Dai	11	B								
15 May	N05W12	359	70	12	Cao	23	B								
16 May	N05W27	360	120	12	Cao	18	B	1							
17 May	N06W40	1	100	10	Dao	23	BG	1			1				
18 May	N06W54	1	70	9	Dao	5	B								
19 May	N06W67	1	50	6	Cao	3	B								
20 May	N06W79	359	20	1	Cao	1	B								
								12	0	0	6	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 359

Region 1745															
10 May	N11E73	340	120	3	Hrx	1	A	4	2						
11 May	N11E62	338	300	5	Dki	5	B	1			2				
12 May	N14E51	336	600	12	Ekc	15	BG	5			1				
13 May	N13E38	335	550	10	Dkc	11	BG	2			6				
14 May	N13E24	335	430	10	Dkc	18	BG				2				
15 May	N13E12	334	390	13	Ekc	28	BG	1			1				
16 May	N12W01	334	350	13	Cki	20	B								
17 May	N13W15	336	300	10	Cko	10	B				3				
18 May	N14W27	334	210	8	Dao	11	B								
19 May	N13W40	334	180	5	Cao	8	B								
20 May	N23W53	333	150	3	Cao	4	B				1				
21 May	N13W66	333	120	5	Cao	5	B	1			2				
22 May	N13W80	333	100	1	Cao	3	B	1	1		1			1	
23 May	N15W92	333	10	1	Axx	1	A								
								15	3	0	19	0	0	1	0

Crossed West Limb.

Absolute heliographic longitude: 334



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
<i>Region 1746</i>															
11 May	S27E63	335	210	5	Dso	2	B	3				3			
12 May	S27E50	337	270	8	Dhi	11	BG	1							
13 May	S28E39	334	230	7	Dsi	8	B								
14 May	S28E28	331	200	7	Dsi	7	B								
15 May	S27E14	333	250	5	Cso	8	B								
16 May	S27W01	334	230	6	Cso	10	B								
17 May	S27W14	335	160	7	Cso	7	B								
18 May	S27W26	333	120	6	Dso	4	B								
19 May	S27W40	334	140	6	Dso	5	B								
20 May	S29W51	332	110	7	Cso	4	B					1			
21 May	S28W64	331	130	2	Hsx	1	A								
22 May	S28W76	330	80	2	Hsx	1	A								
23 May	S28W89	330	90	2	Hsx	1	A								
								4	0	0	4	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 334

Region 1747

12 May	S18E48	338	10	2	Bxo	4	B								
13 May	S18E35	338	40	4	Cao	6	B								
14 May	S18E22	337	80	7	Cao	8	B				1				
15 May	S18E09	337	90	8	Cao	11	B								
16 May	S17W05	338	100	8	Cao	10	B								
17 May	S17W17	338	80	8	Dao	10	B								
18 May	S18W31	338	40	9	Cao	6	B				1				
19 May	S17W45	339	20	3	Hrx	2	A								
20 May	S17W59	340	plage												
21 May	S17W73	341	plage												
22 May	S17W87	341	plage								2				
								0	0	0	4	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 338



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4
<i>Region 1748</i>															
13 May	N12E81	292	250	10	Dki	4	B	5	1	2	12	1			
14 May	N11E63	296	310	11	Eki	5	BGD	2		1	8				
15 May	N11E51	295	260	10	Dki	9	BGD	2		1	2			1	
16 May	N12E36	297	270	10	Dki	19	BGD	2	1		1	1			
17 May	N12E23	298	220	10	Dai	24	BGD		1		2			1	
18 May	N12E11	296	140	10	Dao	12	BD	2			5				
19 May	N12W00	294	110	16	Fao	23	BGD				1				
20 May	N12W15	294	140	11	Eai	25	BGD	6			15	1			
21 May	N13W30	296	120	9	Dai	16	BG				4				
22 May	N12W42	296	60	9	Dao	7	BG				2				
23 May	N12W55	296	20	9	Cro	3	B				2				
24 May	N12W69	297	30	7	Cro	4	B				2				
25 May	N13W83	298	10	1	Axx	2	A								
								19	5	4	56	3	2	0	0

Crossed West Limb.

Absolute heliographic longitude: 294

Region 1750

15 May	S11W13	360	10	3	Bxo	3	B								
16 May	S10W28	360	90	5	Cao	8	B								
17 May	S09W41	2	50	7	Cao	9	B				2				
18 May	S09W54	1	80	6	Dao	9	B				1				
19 May	S09W67	1	90	7	Dai	12	B	6			10	1			
20 May	S10W83	3	100	4	Dai	6	B				2				
								6	0	0	15	1	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 360



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

Region 1751

15 May	S23E23	323	10	3	Bxo	3	B								
16 May	S23E09	324	10	3	Bxo	6	B								
17 May	S23W01	322	0	2	Axx	2	A								
18 May	S23W15	322	plage												
19 May	S23W29	323	plage												
20 May	S23W43	324	plage								1				
21 May	S23W57	325	plage					2							
22 May	S23W71	325	plage												
23 May	S23W85	326	plage												
								2	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 322

Region 1752

16 May	N18W28	1	30	4	Cro	9	B	1							
17 May	N18W40	1	20	4	Cro	7	B								
18 May	N18W52	359	20	5	Cro	4	B	1			1				
19 May	N18W66	360	plage					1			1				
20 May	N18W80	1	plage												
								3	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 1

Region 1753

20 May	N04E63	216	60	5	Dso	2	B	1			1				
21 May	N04E47	218	60	5	Dro	10	B				1				
22 May	N04E36	217	20	3	Cro	3	B								
23 May	N04E22	219	20	9	Cro	7	B								
24 May	N05E09	219	10	6	Bxo	3	B				1				
25 May	N05W04	219	10	1	Axx	2	A								
26 May	N05W19	221	plage												
								1	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 219



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4

Region 1754

20 May	S16E50	229	10	3	Axx	1	A								
21 May	S16E38	229	20	6	Cro	4	B								
22 May	S19E23	230	40	4	Cro	3	B								
23 May	S19E09	232	30	5	Cro	7	B								
24 May	S19W03	231	20	8	Cro	9	B								
25 May	S19W17	232	30	8	Dro	9	B								
26 May	S19W27	229	10	4	Cro	3	B				1				
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 231

Region 1755

21 May	N10E62	204	120	3	Dso	3	B	1							
22 May	N10E52	201	250	10	Dsi	7	BG				3				
23 May	N11E40	201	290	10	Dhi	9	BG	2			2	1			
24 May	N11E26	202	220	10	Dai	12	BG				2				
25 May	N11E12	203	220	10	Dai	12	B	2			2				
26 May	N12W00	202	180	9	Dai	19	B								
								5	1	0	9	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 202

Region 1756

21 May	S20E54	213	100	6	Dao	10	B	1			3	1			
22 May	S20E41	212	230	9	Dai	13	BG	3			7				
23 May	S20E27	214	250	13	Ehi	19	BG	3			5	1			
24 May	S20E15	213	290	13	Ehi	21	BG	1			7				
25 May	S20E01	214	290	14	Ehi	21	BG	2							
26 May	S20W13	215	270	15	Ehi	18	B	2			4				
								12	0	0	26	2	0	0	0

Still on Disk.

Absolute heliographic longitude: 214

Region 1757

24 May	S09E84	145	plage					2							
25 May	S09E70	145	120	5	Hsx	1	A								
26 May	S08E54	148	80	2	Hsx	1	A								
								2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 148



Region Summary - continued

Location		Sunspot Characteristics						Flares							
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	10 ⁻⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		<i>Region 1758</i>													
26 May	S23E73	129	10	1	Axx	1	A	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 129

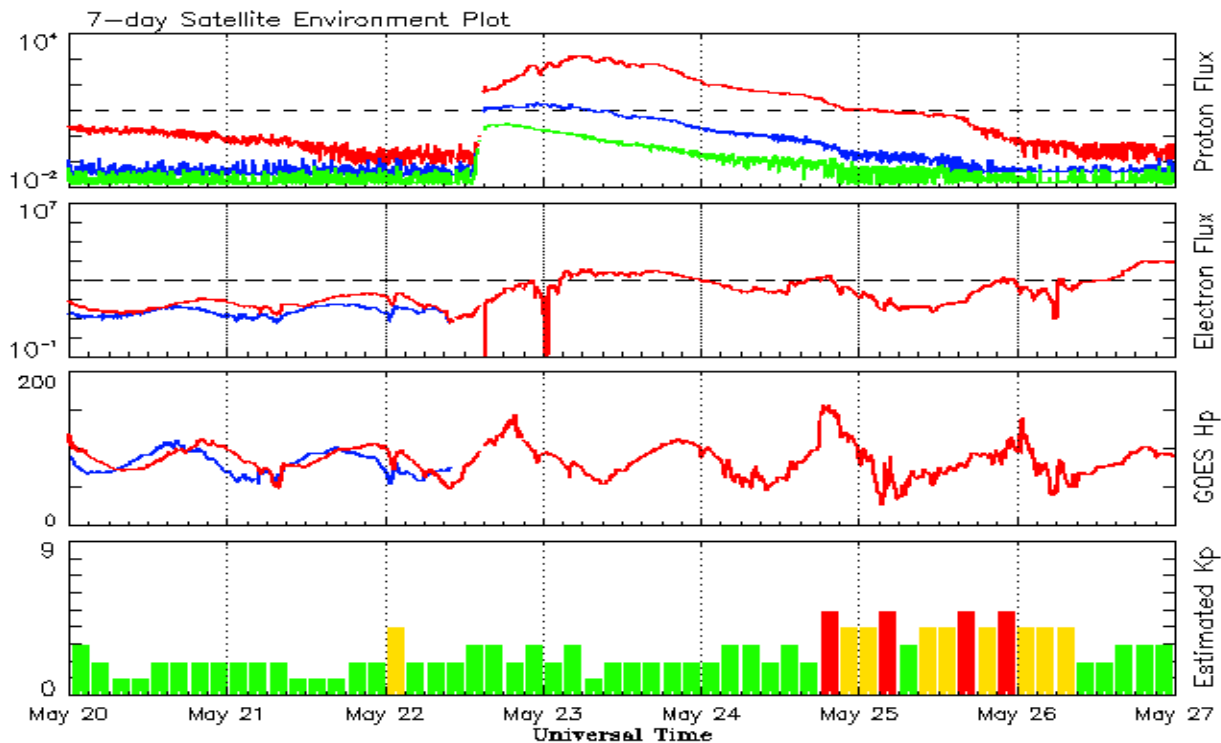


Recent Solar Indices (preliminary)
Observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2011									
May	61.4	41.6	0.68	69.0	47.6	95.9	105.6	9	7.5
June	55.5	37.0	0.67	76.5	53.2	95.8	110.9	8	7.4
July	67.0	43.8	0.66	82.5	57.3	94.2	115.4	9	7.3
August	66.1	50.6	0.77	84.9	59.0	101.7	117.9	8	7.4
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
2012									
January	91.3	58.3	0.64	92.0	65.5	133.1	124.4	6	8.3
February	50.1	32.9	0.66	94.2	66.9	106.7	126.7	7	8.4
March	77.9	64.3	0.82	94.1	66.8	115.1	126.8	14	8.1
April	84.4	55.2	0.65	91.3	64.6	113.1	125.8	9	8.0
May	99.5	69.0	0.69	87.7	61.7	121.5	123.8	8	8.2
June	88.6	64.5	0.73	83.9	58.9	120.5	121.1	10	8.3
July	99.6	66.5	0.67	82.4	57.8	135.6	119.5	13	8.3
August	85.8	63.0	0.74	83.1	58.2	115.7	119.2	7	8.1
September	84.0	61.4	0.73	83.7	58.1	123.2	118.9	8	7.8
October	73.5	53.3	0.73	85.0	58.6	123.3	119.2	9	7.4
November	89.2	61.8	0.69			120.9		6	
December	60.4	40.8	0.68			108.4		3	
2013									
January	99.8	62.9	0.63			127.1		4	
February	60.0	38.0	0.63			104.4		5	
March	81.0	57.9	0.71			111.2		9	
April	112.8	72.4	0.64			125.0		5	

Note: Values are final except for the most recent 6 months which are considered preliminary.
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 20 May 2013*

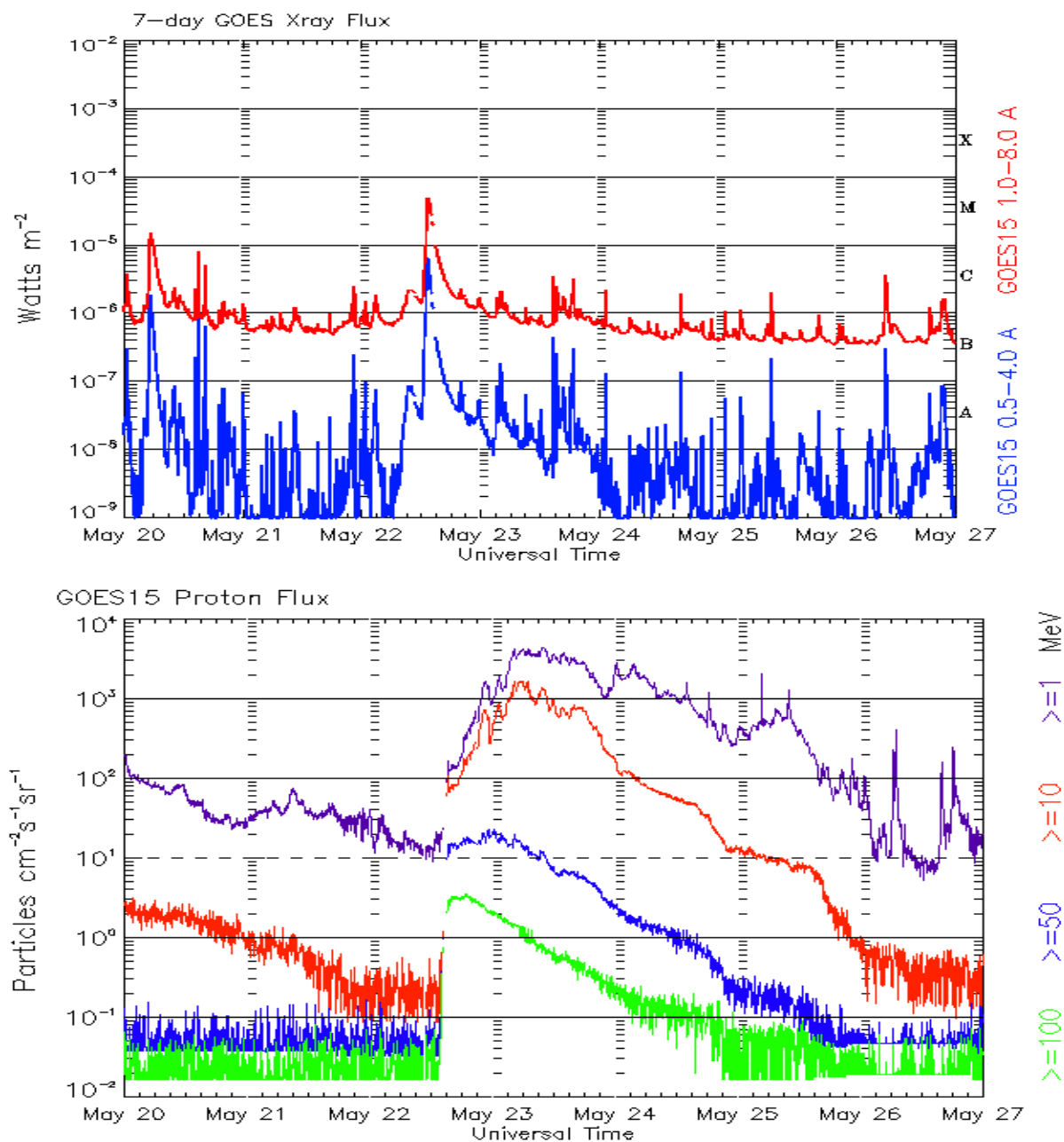
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



*Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 20 May 2013*

The x-ray plots contains five-minute averages x-ray flux (Watt/m²) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral flux units (pfu = protons/cm² -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned.
Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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